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Connecting Alaskans: A Book Review and Commentary on Universal Service in the Broadband Age

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> Overcoming the challenges of connecting Alaskans scattered in remote communities to each other and the rest of the world has required both technological ingenuity and a commitment to provide service where networks are costly to build and maintain, and customers are few.[1]

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Connecting Alaskans provides a richly detailed narrative of the evolution of telecommunications in Alaska. Ms. Hudson vividly describes the obstacles to bringing advanced telecommunications to one of the most geographically challenging states in our country and provides an excellent case study of the role that telecommunications public policy can play in shaping the lives of Americans. Ms. Hudson focuses on the trials of bringing dial tone, long distance, and broadcast television to the tundra. She acknowledges that "providing universal access to broadband that is both affordable for users and sustainable for providers is the latest Alaska communications challenge."[2] Her examination of the history of Alaska telecommunications offers valuable insight into how state and federal regulatory policy facilitated universal telephone service in the past and how it might continue to play a critical role in the age of broadband.

I. ALASKA'S TELECOMMUNICATIONS EVOLUTION

The evolution of Alaska's telecommunication networks reflects the critical role played by the state, by the federal government, by private entities and by the military.[3] Without deliberate prioritization by Alaska's governor and legislature, basic dial tone would never have spread to the remotest areas of Alaska.[4] "[T]here are few developments that will change the nature of Alaska as dramatically or permanently as the establishment and operation of a modern communications system."[5] History bore out the truth of this statement

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[1] HEATHER E. HUDSON, CONNECTING ALASKANS: TELECOMMUNICATIONS IN ALASKA FROM TELEGRAPH TO BROADBAND 1 (2015).

[2] *Id.* at 5.

[3] *See* WALTER B. PARKER, TELECOMMS. AND INFO. SYS. HISTORY OF ALASKA (2008), http://www.alaska.edu/oit/bbtaskforce/docs/TELECOMMUNICATIONS%20AND%20INFORMATION%20SYSTEM%20HISTORY%20OF%20ALASKA.pdf [https://perma.cc/85CZ-2246] (describing how the Alaska Gold Rush led to expanded military presence, and thus provided the incentive for the military to create the Western Alaska Military Cable and Telegraph Systems, or WAMCATS).

[4] HUDSON, *supra* note 1, at 22-24 (The Governor of Alaska noted that after World War I, there was no inducement for private enterprise to enter the Alaska telecommunications market, so "it logically devolves upon the Government to meet the growing needs of the population.").

[5] *Id.* at 65 (quoting an Anchorage Daily News article discussing the Talketna earth station).

and the continued deployment of broadband will continue to demonstrate it.

Ms. Hudson's description of the evolution of telecommunications in Alaska represents an epic undertaking that occasionally provides minute descriptions and lengthy quotations to tell the story.[6] The dialogue threatens to become bogged down in the extraordinary detail[7] but overall *Connecting Alaskans* is an important achievement. Ms. Hudson's close involvement in the development of telecommunications in Alaska has the potential to distract any reader referring to the footnotes, but absent a dedicated historian and scribe the story would not have been told.[8]

The history of home-grown telecommunications cooperatives in Alaska reflects a similar story told in many rural areas of America.[9] No Bell Operating Company sought to serve the highest cost areas of Alaska[10] or rural America.[11] The potential return on investment could

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[6] *Compare id.* at 93-106 (discussing in great detail the introduction of commercial satellite communications in Alaska), *with id.* at 206 (minimally addressing the critically important Matanuska Telephone Association and General Communications, Inc. Suspension and Modification hearing).

[7] *See, e.g.*, *id.* at 161 (discussing at length the long distance calling habits of the typical 1980s Alaskan).

[8] *See, e.g.*, *id.* at 95 n.2 (discussing Hudson's experience photographing earth stations); 175 n.48 (quoting Hudson's keynote speech at the "Visions of Alaska's Future" conference in 1993).

[9] Rob Frieden, *Killing with Kindness: Fatal Flaws in the $6.5 Billion Universal Service Funding Mission and What Should Be Done to Narrow the Digital Divide*, 24 CARDOZO ARTS & ENT. L.J. 447, 454-55 (2008) ("A fundamental problem in achieving universal access to telecommunication services lies not in the goal itself, but rather in developing strategies for financing and achieving that goal . . . AT&T's competitors had no interest in charging higher rates to subsidize local service and neither did AT&T when the local Bell System companies became separate entities."); Robert D. Atkinson, *Framing a National Broadband Policy*, 16 COMMLAW CONSPECTUS 145, 150-51 (2007) (discussing how the Rural Electric Association's assistance establishing rural electric cooperatives and extending utilities service is analogous to broadband deployment today).

[10] *See* ALASKA TELEPHONE ASSOCIATION, PETITION FOR DECLARATORY RULING REGARDING APPLICABILITY OF THE INTRAMTA RULE TO LEC-IXC TRAFFIC 2, https://ecfsapi.fcc.gov/file/60001040037.pdf [https://perma.cc/RB9U-YBZG] (noting that Alaska has no current or historic regional bell operating company).

[11] Steven G. Parsons & James Bixby, *Universal Service in the United States: A Focus on Mobile Communications*, 62 FED. COMM. L.J. 119, 123-24 (2010) (discussing AT&T's original focus on business customers in major cities, leaving servicing to smaller cities and rural towns to rivals).

not justify the significant expenditure. Just as in the era of rural electrification, it took both federal investment, state commitment and local determination to build the utility networks that changed the quality of life experienced by Americans.[12] Communities banded together to leverage whatever financial support they could muster and built telecommunications networks to deliver dial tone, albeit the initial result was often one telephone in the town square, where no investor owned utility would have committed resources.[13]

The immense task of bringing rudimentary communications infrastructure to Alaska is strongly reminiscent of the challenges currently facing the state in extending modern broadband infrastructure across the same inhospitable terrain.[14] Alaska lacks a statewide network to connect its far flung communities to the Internet.[15] In too many areas of the country, including Alaska, investor-owned utilities lack the investment incentive to prioritize the

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[12] Patricia M. Worthy, *Racial Minorities and the Quest to Narrow the Digital Divide: Redefining the Concept of "Universal* Service," 26 HASTINGS COMM. & ENT. L.J. 1, 8 n.24 2003 (discussing the Federal government's amendment of the Rural Electrification Act of 1936 to create loan programs to ensure greater access to telephone service in rural areas).

[13] Investor-owned utilities continue to limit investment of resources in sparsely populated rural areas. *See* Kevin Werbach, *No Dialtone: The End of the Public Switched Telephone Network*, 66 FED. COMM. L.J. 203, 215-16 (2014) (noting that both AT&T and Verizon acknowledged an intention to cut off copper-based PSTN service to rural areas and serve them with wireless service, while in urban areas upgrading networks to provide IP-based services).

[14] Alaska's rural and remote areas suffer the same challenges facing many rural communities. Olivier Sylvain, *Broadband Localism*, 73 OHIO ST. L.J. 795, 797 (2012) ("These private companies, however, only invest in broadband in densely populated or affluent local areas from which they expect immediate returns. This strategic choice has exacerbated existing gaps in access and quality of service; users in only the most fortunate urban centers in the country can count on state-of-the-art connectivity while others can barely count on the skimpiest of service.").

[15] A combination of federal and private investment results in the construction of middle mile networks in recent years. *See GCI TERRA*, http://terra.gci.com [https://perma.cc/V2JK-CZGK]; *see also Alcatel-Lucent and Quintillion Subsea Holdings to Build Undersea Cable System Connecting Six Communities Along the North Slope of Alaska*, NOKIA, https://networks.nokia.com/press/2015/alcatel-lucent-and-quintillion-subsea-holdings-build-undersea-cable-system-connecting-six [https://perma.cc/XQD8-XTHQ]. Telephone cooperatives have enhanced last mile networks across the state. *See* ALASKA RURAL COALITION, COMMENTS OF THE ALASKA RURAL COALITION – IN THE MATTER OF CONNECT AMERICA FUND, ET AL. (2014) https://ecfsapi.fcc.gov/file/7521752375.pdf [https://perma.cc/8K36-D3KC].

funds necessary to build broadband capable networks.[16] Communities are once again pooling their resources and communal will to invest in the infrastructure necessary to make real advances in the quality of life including improved educational opportunity, access to health care,[17] vocational training,[18] and enhanced public service access.[19]

II. REFLECTIONS ON UNIVERSAL SERVICE IN THE BROADBAND AGE

The concept of universal service evolved alongside the telephone itself.[20] As the telephone became ubiquitous, national policy makers worried that the rural areas of the country would be stranded without a more efficient way to communicate than telegraph.[21] Traditionally, "[t]he public switched network embodies the principle that everyone in the United States should have access to basic communications services."[22] The deployment of the telephone (both local and long distance[23]) as well as broadcast television in Alaska demonstrates this

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[16] *Coordinating Future Investments in Broadband: Before the Subcomm. on Livestock, Rural Development, and Credit of the H. Comm. on Agriculture,* 113th Cong. (2014) (testimony of Robert L. Hance, President and Chief Executive Officer, Midwest Energy Cooperative).

[17] Nichole L. Millard, Note, *Section 254 of the Telecommunications Act of 1996: A Hidden Tax?*, 50 FED. COMM. L.J. 255, 266 (1997) (discussing the addition of Rural Health Care support to the Telecommunications Act of 1996).

[18] Worthy, *supra* note 12, at 45-46 (discussing how Americans are increasingly dependent on Internet access for basic employment needs).

[19] Sylvain, *supra* note 14, at 805 ("Local governments are lighting the spark for broadband infrastructure build-out. They are mobilizing an array of local anchor institutions and resources to bring service to residents.").

[20] The concept of universal service is generally credited to Theodore Vail, President of AT&T, in a 1907 speech where he envisioned "one system, one policy, universal service." Parsons & Bixby, *supra* note 11, at 123.

[21] A long tradition of implicit subsidies to rural customers existed well before explicit subsidies were implemented in the 1996 Telecommunications Act. Frieden, *supra* note 9, at 455 (discussing how carriers charged urban customers higher long distances costs in order to subsidize the cost of providing service to rural customers).

[22] Jodie Griffin, *Universal Service in an All-IP World,* 23 COMMLAW CONSPECTUS 346, 347 (2015).

[23] HUDSON, *supra* note 1, at 33-38 (discussing the introduction of the White Alice communications network that linked Alaska to the Lower 48 in the 1950s).

dynamic in dramatic fashion.[24] Absent state and federal investment, coupled with sheer individual and institutional determination, Alaskans would still rely on rudimentary communications technology.[25]

A. Universal Broadband Benefits All Americans

The United Nations recognizes access to broadband Internet access as a public utility and a fundamental human right.[26] Access to robust broadband has become essential to participation in the modern economy, regardless of physical location.[27] Americans require access to broadband to access many government programs, including unemployment benefits,[28] vocational training programs,[29] and food

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[24] The first broadcast television station in Alaska, KTVA, opened with a proclamation that noted its dedication to the people of Alaska: "It is the question of whether or not KTVA maintains its integrity as a public servant, its support of civic institutions, local business, its loyalty to Alaska and unfailing allegiance to the United States." *Id.* at 46.

[25] As late as the 1960s, much of Alaska "existed in a communications vacuum a great deal of the time." *Id.* at 49. The substantial efforts of Alaska Senator Bob Bartlett greatly assisted in moving Alaska towards a more modern communications system.

[26] "Indeed, the Internet has become a key means by which individuals can exercise their right to freedom of opinion and expression." Frank La Rue (Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression), *Rep.* to U.N. Human Rights Council, ¶ 20, U.N. DOC. A/HRC/17/27 (May 16, 2011). The FCC also categorized broadband as a public utility. Report and Order on Remand, Declaratory Ruling, and Order, 30 FCC Rcd. 5601, 5610 (2015) ("We find that broadband Internet access service is a 'telecommunications service' and subject to section 201, 202, and 208 [of the Telecommunications Act] . . . As a result, commercial arrangements for the exchange of traffic with a broadband Internet access provider are within the scope of Title II [of the Communications Act]."); *see also* Kevin Werbach, *Connections: Beyond Universal Service in the Digital Age*, 7 J. ON TELECOMM. & HIGH TECH. L. 67, 67 (2009) ("Broadband connectivity is the fundamental public utility of the digital age.").

[27] President Bush articulated a "goal of universal broadband by 2007." Werbach, *supra* note 26, at 71 (*citing* President George W. Bush, Remarks by the President on Homeownership (Mar. 26, 2004), https://georgewbush-whitehouse.archives.gov/news/releases/2004/03/20040326-15.html [https://perma.cc/Y7RP-33LA]).

[28] Mignon Clyburn, *Importance of Broadband*, FCC BLOG (Aug. 26, 2010), https://www.fcc.gov/news-events/blog/2010/08/26/importance-broadband [https://perma.cc/E6TG-RG6D] (discussing how digital literacy is a necessity to receiver unemployment benefits, which are applied for online in Minnesota).

assistance programs.[30] Access to distance education has emerged as a critical priority for school districts outside urban areas.[31] Even essential access to health care resources require dependable broadband.[32]

The Federal Communications Commission ("FCC") fundamentally redefined universal service to shift priority of the program and funding from voice telephone service to broadband Internet service.[33] The FCC recognizes the critical importance of broadband[34] and the

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[29] Sylvain, *supra* note 14, at 834 (noting that the FCC launched initiatives aimed at accelerating Broadband deployment, including partnerships that provide online job certification programs).

[30] The more isolated a community, the more critical access to curriculum and distance learning becomes. Griffin, *supra* note 22, at 360 (discussing how access to basic phone service is presupposed throughout federal law, including the requirement that state agencies maintain toll-free phone numbers for non-English speakers who wish to inquire about food stamps).

[31] FCC Commissioner Rosenworcel writes and speaks extensively on the issue of the "homework gap." JESSICA ROSENWORCEL, MIAMI HERALD, HOW TO CLOSE THE 'HOMEWORK GAP' (Dec. 5, 2014), https://transition.fcc.gov/files/documents/how-close-to-the-homework-gap-rosenworcel-editorial.pdf [https://perma.cc/WA73-JPV9]. "There was a time when doing basic schoolwork required no more than a little bit of quiet, a clear workspace, and a pencil. No more. Today, 7 in 10 teachers assign homework that requires Internet access. Kids may be connected in the classroom, but if they are disconnected at home getting basic schoolwork done is hard." *See* STATEMENT OF FCC COMMISSIONER JESSICA ROSENWORCEL ON PEW RESEARCH CENTER HOMEWORK GAP FINDINGS, https://apps.fcc.gov/edocs_public/attachmatch/DOC-333103A1.pdf [https://perma.cc/Z65G-PBZX].

[32] Atkinson, *supra* note 9, at 157 (discussing how health care is an area where broadband promises substantial benefits, such as improved health care outcomes and potential lower costs).

[33] TREVOR R. ROYCROFT, THE IP/BROADBAND TRANSITION – PUBLIC POLICY STILL MATTERS 3-4 (2013) (discussing the interrelated nature of legacy networks and next generation networks, and specifically noting that ILEC investment in legacy networks both maintains the legacy network and allows the ILEC to cover broadband over the legacy network), http://nasuca.org/nwp/wp-content/uploads/2013/11/01-13-2014-NASUCA-2-of-2.pdf [https://perma.cc/M6XR-WP42]. *See also* Second Further Notice of Proposed Rulemaking, Order on Reconsideration, Second Report and Order, and Memorandum Opinion and Order, 30 FCC Rcd. 7818, 7819-7124 (2015) (June 22, 2015) (noting that the Lifeline program has provided basis telephone access to low-income Americans for 30 years, but that now access to advanced broadband internet is required to achieve that same benefit), https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-71A1.pdf [https://perma.cc/LH7N-BG4V].

[34] "Today, Americans turn to broadband Internet access service for every facet of daily life, from finding a job to finding a doctor, from connecting with family to making new friends,

waning role of traditional dial tone and its funding priorities reflect that priority.[35] Unfortunately, the focus on broadband tends to neglect the traditional legacy telephone network, which remains essential to the provision of broadband in many rural communities.[36] The universal service mandate contained in the Communications Act perpetuates an honorable mission to extend telecommunications services, now including broadband, to all Americans.[37] Accomplishing that goal in Alaska and across rural America will yield dividends for all by enhancing civil discourse, public safety and education, but it will take a dedication of significant funds by the FCC and carriers to achieve.

B. The Digital Divide Hampers Economic Development

The digital divide continues to isolate rural and remote areas.[38] The market incentives to deliver robust broadband to densely populated areas do not exist in rural and remote areas[39] creating a

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from becoming educated to being entertained." 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, 30 FCC Rcd. 1375, 1377 (2015), https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-10A1.pdf [https://perma.cc/JT2M-FG7F].

[35] *See generally* Report and Order, 29 FCC Rcd. 15,644 (2014) (hereinafter CAF Phase II Order); Report and Order and Further Notice of Proposed Rulemaking, 28 FCC Rcd. 8870 (2014).

[36] In many areas, third party competitive carriers utilize the incumbent's copper loops to provide DSL or Ethernet service as an alternative to the incumbent's broadband service. *Overview of the National Broadband Plan*, 18 COMMLAW CONSPECTUS 517, 524 (2010).

[37] *See* 47 U.S.C. § 254 (1996).

[38] Edward J. Sholinsky, Note, *Blocking Access to the Information Superhighway: Regulating the Internet Out of the Reach of Low-Income Americans*, 38 RUTGERS L.J. 321, 326-28 (2006) (discussing how broadband internet is cost prohibitive for some, thus creating a digital divide between those who can afford to take full advantage of the internet and those who cannot).

[39] *See* Tom Wheeler, *Closing the Digital Divide in Rural America,* FCC BLOG (Nov. 20, 2014), https://www.fcc.gov/news-events/blog/2014/11/20/closing-digital-divide-rural-america [https://perma.cc/QL5D-3PPE] ("An estimated 15 million Americans, primarily in rural communities, don't even have access to entry-level broadband in their homes"); *see also* Sylvain, *supra* note 14, at 797 (noting that private companies are only investing in broadband in the densely populated urban areas from which they can expect to generate immediate returns); R. Alex DuFour, *Voice Over Internet Protocol: Ending Uncertainty and Promoting Innovation through a Regulatory Framework*, 13 COMMLAW CONSPECTUS 471, 496 (2005) (discussing how for traditional phone service the cost of rural expansion

second class of citizens in areas lacking access to robust broadband.[40] Alaska telecommunications embody the struggle to extend communications technology to all regardless of race, socio-economic status or location.[41] Many rural areas in the country experience the same frustrating lack of access to broadband.[42]

Robust broadband delivers economic development to communities and individuals. Communities with high capacity broadband access experience a dramatic increase in revenue and job creation.[43] The availability of robust broadband creates a material

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outweighs the benefit because the service only goes to a small population spread throughout a wide area).

[40] FCC Commissioner Rosenworcel describes the homework gap as the cruelest part of the new digital divide. STATEMENT OF FCC COMMISSIONER JESSICA ROSENWORCEL ON PEW RESEARCH CENTER HOMEWORK GAP FINDINGS, *supra* note 31.

[41] United States national communications policy aims to ensure that everyone benefits from communications technologies, regardless of race, color, religion, national original, sex, location, disability, or income. Griffin, *supra* note 22, at 349. Those aims are difficult to achieve given Alaska's environmental, geographic, and climactic challenges. *See also* Letter from T.W. Patch, Chairman, Regulatory Commission of Alaska, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 (filed Feb. 4, 2013) ("Our discussion touched on how Alaska's lack of roads and electric grids as well as other factors such as extensive reliance on satellite make application of national models to Alaska's service providers inappropriate. We also discussed how regulatory uncertainty is hampering Alaska's carriers' ability to invest and borrow the funds needed to move towards universal broadband").

[42] "A persistent urban-rural divide has left 39 percent of the rural population without access to fixed broadband." FCC, FACT SHEET: CHAIRMAN WHEELER'S PROPOSED 2016 BROADBAND PROGRESS REPORT 1 (Jan. 7, 2016), https://apps.fcc.gov/edocs_public/attachmatch/DOC-337173A1.pdf [https://perma.cc/Z9SH-RDZH]. *See also* Cary Adickman, *Special Access: The Harm of Premature Deregulation in Telecommunications*, 31 CARDOZO ARTS & ENT. L.J. 113, 129 (2012-13) (noting that in urban areas it is economical for the ISP to pay the cost of building new conduit, but in rural areas the ISP will usually attempt to purchase special access circuits from a local ILEC, and many rural areas are not served by lines with sufficient bandwidth to provide broadband internet access).

[43] *See generally* STEPHEN POCIASK, TELENOMIC RESEARCH, BUILDING A NATIONWIDE BROADBAND NETWORK: SPEEDING JOB GROWTH (2002), http://www.lafayetteutilities.com/uploads/BuildingaNationwideBroadbandNetwork.pdf [https://perma.cc/6PZL-SPTK]. *See also* CONNECTED NATION, THE ECONOMIC IMPACT OF STIMULATING BROADBAND NATIONALLY (2008), http://www.connectednation.org/_documents/connected_nation_eis_study_full_report_02212008.pdf [https://perma.cc/TDU5-RV7M].

increase in residential real estate values.[44] Expanding universal service to include a broadband connection to every American unlocks virtually unlimited potential in rural America.[45] Making universal broadband a national priority should be embraced by all, but it will take a concerted effort by stakeholders at every level to achieve it.[46]

C. Telecommunications Development in Alaska Provides a Model for Universal Broadband in Rural Areas.

Alaska overcame the challenge of extending dial tone and broadcast television to the remotest areas of the state by utilizing every opportunity and by relentless determination on the part of the affected communities,[47] communications providers,[48] and state

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[44] According to a recent study, the average home value increases 1.7% where the buyer can access broadband. GABOR MOLNAR ET AL., REEVALUATING THE BROADBAND BONUS: EVIDENCE FROM NEIGHBORHOOD ACCESS TO FIBER AND UNITED STATES HOUSING PRICES 16-18 (2015), http://www.lightwaveonline.com/content/dam/lw/documents/FTTH_Report_06_26_2015.pdf [https://perma.cc/P4TU-MTCC] (concluding that where gigabit speed is available, residential home values may be up to 7.1% higher than similar homes with access to 25 megabits or less).

[45] When Internet access initially became available, rural adoption was higher than the national average. U.S. DEP'T AGRIC., http://www.ers.usda.gov/media/1133263/eb-23.pdf [https://perma.cc/68WD-G6Q7]. As technology evolved, rural areas began to lag behind in access to applications that required more than rudimentary dialup service. U.S. DEP'T AGRIC., http://www.ers.usda.gov/media/155154/err78_1_.pdf [https://perma.cc/96D7-FDZZ].

[46] The potential growth in productivity and crop yield resulting from access to broadband cannot be understated. Agricultural states, like South Dakota, have studied the importance of broadband and determined that "[f]rom GPS to fiber optics to computer-driven harvesters, some South Dakota farmers and ranchers use the highest level of technology and are among the most efficient producers in the world." *Broadband Benefits for Agriculture,* SOUTH DAKOTA BROADBAND INITIATIVE, https://broadband.sd.gov/Benefits-Agriculture.aspx [https://perma.cc/KP9X-N5LW]. Broadband allows farmers and ranchers to boost productivity, monitor and respond to weather variability, exchange information and conduct business with others in the industry and monitor prices. *See id.*

[47] *See* HUDSON, *supra* note 1, at 81 (discussing satellite doctor calls with remote Alaska villages powered by NASA's ATS-1 satellite).

[48] *See id.* at 181 ("One phone company was founded when a young technician obtained some PBXs (private branch exchanges) that had been deluged in the Fairbanks flood of 1964, cleaned them up, and began serving sites in rural Alaska. Other companies had been founded in rural locations through the efforts of similar entrepreneurs, often operating on shoestring funding and relying on 'sweat equity' to build the phone systems.").

government and federal representatives.[49] Leveraging military resources, national expertise, and multiple funding sources closed the gap in funding and technical knowledge.[50] Ms. Hudson's dedicated rendition of this history provides an excellent blueprint of how every stakeholder must step up to achieve the goal of universal telecommunications, whether it is dial tone or broadband.

Closing the digital divide between Americans with easy, affordable access to robust broadband and those without it will take a similar multi-prong approach. Federal investment has built broadband infrastructure and has supported telecommunications networks, but it is not enough to bridge the gap between urban areas with plentiful broadband and rural areas lacking even modest access.[51] Long-term, sustained investment by the federal government will continue to make progress closing the digital divide.[52]

States continue to grapple with their role in supporting the deployment of robust broadband networks.[53] The role of state and local governments remain essential to support broadband efforts both

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[49] *See id*. at 64-67 (discussing the efforts by Governor Walter Hickel and US Senator Bob Bartlett in the creation of the Talkeetna earth station satellite).

[50] It is widely known that the Internet began as a military and defense contractor network. Barbara Esbin, *Internet Over Cable: Defining the Future in Terms of the Past*, 7 COMMLAW CONSPECTUS 37, 46 (1999) (summarizing the ARPANET project and early use by research institutions).

[51] *See* TIM ANDERSON, STATELINE MIDWEST, STATES EYE NEW INVESTMENTS, PROGRAMS AND STATUTORY CHANGES THAT COULD IMPROVE CONNECTIVITY IN MIDWEST 6-7 (2014), http://www.csgmidwest.org/policyresearch/documents/broadband.pdf [https://perma.cc/PMG2-RSAM].

[52] CAF Phase II will devote an estimated $9 billion in broadband over the next six years. PRESS RELEASE, FCC, STATE, COUNTY AND CARRIER DATA ON $9 BILLION, SIX-YEAR CONNECT AMERICA FUND PHASE II SUPPORT FOR RURAL BROADBAND EXPANSION (Sept. 15, 2015), https://apps.fcc.gov/edocs_public/attachmatch/DOC-335269A1.pdf [https://perma.cc/9C3X-7P9P].

[53] *See* THE STATEWIDE BROADBAND TASK FORCE, A BLUEPRINT FOR ALASKA'S BROADBAND FUTURE (2014), http://www.alaska.edu/oit/bbtaskforce/docs/Statewide-Broadband-Task-Force-Report-FINAL.pdf [https://perma.cc/HHV4-H8G5]; *c.f.* GOVERNOR'S TASK FORCE ON BROADBAND, 2014 ANNUAL REPORT (2014), https://mn.gov/deed/assets/2014-taskforce-report_tcm1045-190727.pdf [https://perma.cc/JZ5E-7ZJ6] (noting Minnesota's goal of achieving border-to-border broadband access requires investment from both public and private stakeholders).

financially and through public policy.[54] Every year more states join the effort to promote network deployment.[55] Experience suggests that municipal investment works most effectively when combined with the expertise of telecommunications partners.[56]

Private investment plays a significant role in the expanding deployment of broadband infrastructure.[57] Telecommunications carriers of all types have spent billions of dollars building networks, often in combination with state or federal funds. Less traditional entities have also made substantial investments to build broadband networks. For example, rural electric cooperatives have begun to serve their communities which lacked access to broadband.[58] Without the financial investment and expertise proffered by private entities, federal and state support would be unable to achieve the common goal of universal broadband.

III. CONCLUSION

Telecommunications in Alaska developed from laboriously built telegraph lines to expensive satellite connections to fiber broadband

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[54] "State and local governments are starting to play an important role in getting broadband internet access to the American public." The Editorial Board, *Look to the States on Broadband,* N.Y. TIMES (Apr. 20, 2015), https://www.nytimes.com/2015/04/20/opinion/look-to-the-states-on-broadband.html?_r=2 [https://perma.cc/QT2N-ATHD].

[55] *See Broadband Grant Program*, MINN. OFF. OF BROADBAND DEV., http://mn.gov/deed/programs-services/broadband/grant-program/ [https://perma.cc/XT2P-DSA7]. *See also Last Mile Program for Unserved Towns*, MASS. BROADBAND INST., http://broadband.masstech.org/building-networks/last-mile/program-unserved-towns [https://perma.cc/ETL6-A6ED].

[56] The National Telecommunications & Information Administration published an overview of common broadband public/private partnership models that have proven successful. *See* BROADBAND USA, AN INTRODUCTION TO EFFECTIVE PUBLIC-PRIVATE PARTNERSHIPS FOR BROADBAND INVESTMENTS 3 (2015), http://www2.ntia.doc.gov/files/ntia_ppp_010515.pdf [https://perma.cc/5GCW-QW4H].

[57] Private sector broadband investment was $78 billion in 2014. *Broadband Investment*, US TELECOM, https://www.ustelecom.org/broadband-industry/broadband-industry-stats/investment [https://perma.cc/ZH25-THSZ].

[58] *See, e.g.*, Cathy Cash, *Co-ops Win FCC Funds for High-Speed Internet* (2015), http://www.ect.coop/emerging-technologies/telecom-emerging-technologies/co-ops-win-fcc-funds-for-high-speed-internet/79101 [https://perma.cc/2YRX-ATU7].

networks.[59] *Connecting Alaskans* beautifully tells the story, but its greater contribution to the field lies in its application to the growing digital divide in Rural America.[60] The challenges to bringing robust broadband in Alaska are exacerbated by its extreme climate and geography, but all providers and consumers understand the common underlying struggle to overcome distance and sparse population.[61]

Research demonstrates that access to affordable broadband remains essential to full participation in today's economy.[62] Experience suggests that no one solution is sufficient to extend broadband to areas of low population and geographic, topologic or climatic challenge.[63] Including broadband in the universal service landscape makes public policy sense and serves the interests cited for the universal availability of telephone service over the decades.[64] Communications evolving from telegraph to broadcast television to broadband creates community and facilitates participation in civil discourse.[65] Investment coupled with a national prioritization to close

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[59] *See* HUDSON, *supra* note 1, at 253 (noting that technological innovation has been key to delivering communications services to Alaska).

[60] *See* Availability of Advanced Telecommunications Capability in the United States, Fourth Report to Congress 69 Fed. Reg. 59,595 (Oct. 5, 2004) (dissenting statement of Commissioner Michael Copps) (arguing that market forces alone have not produced rapid deployment to communities traditionally unserved in rural America).

[61] Parsons, *supra* note 20, at 139-40 (discussing the economic rationale for increased telecommunications subsidies for rural areas); K. Joon Oh, *Completing the Connection: Achieving Universal Service Through Municipal Wi-Fi*, 2006 DUKE L. & TECH. REV. 1, 3 (2006) (noting that the lack of cost-effective technologies made it cost prohibitive to deliver phone services to rural communities).

[62] Werbach, *supra* note 26, at 67 ("Like roads, libraries, electric grids, schools and telephone networks before it, broadband will be a basis through which citizens are empowered to realize their potential, economic productivity is fostered, and major social goals are achieved."); Griffin, *supra* note 22, at 365 ("Broadband is only becoming more and more necessary for day-to-day personal, educational, and occupational activities.").

[63] *See* HUDSON, *supra* note 1, at 253 (noting that Alaskans have frequently adopted existing technology to better cope with Alaska's climate, terrain, and isolation).

[64] Griffin, *supra* note 22, at 365 ("The idea that broadband access service itself has now become a 'basic service,' that is properly included in universal service policies, is gaining increasing traction among many stakeholders.").

[65] Richard S. Whitt, *Evolving Broadband Policy: Taking Adaptive Stances to Foster Optimal Internet Platforms*, 17 COMMLAW CONSPECTUS 417, 421 (2009) ("We live in a networked economy, formed bottom-up by interactions between people in a highly-

the digital divide serves us all and prepares us to tackle the challenges ahead.

connected marketplace. This networked economy thrives where space is available for experimental evolution in which new ideas emerge and technology constantly is refined").